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SCHOOL CREDIT FOR HOME PRACTICE IN AGRICULTURE.[1]

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INTRODUCTION.

A new problem has arisen in the administration of rural schools due to the advent of home projects in agriculture and other subjects in which the home becomes the laboratory of the school. To the teacher falls the task of giving a rank for such home work and applying that rank with proper weight to the general scholarship average of the individual.

To the superintendent of schools and other officials falls the duty of determining how much credit shall be allowed; whether there shall be prescribed or optional home work; what shall be the ratio between recitation hours and hours of field work; also the ratio of "boy hours" of labor to "man hours." From farm-management studies acceptable records of labor requirements are to be obtained and these are to be translated into terms of usual school rank and credit. No form of school credit or rank for home work is sure to arouse permanent interest in such work unless related to the credit system used for other school subjects.

This bulletin is intended to assist the rural teacher in her part of this problem and to discuss the basis of such credit for the benefit

[1] Prepared under the direction of C. H. Lane, Chief Specialist in Agricultural Education.

NOTE.—This bulletin is intended to assist superintendents and teachers of rural schools who desire to use home practice in agriculture as an educational feature, giving proper rank and credit on the school records.

of school officials who may desire to install such a plan. Several farm-management studies are utilized which may assist both the teacher and the officials.

METHODS FOR THE TEACHER'S USE.

It is here assumed that the school officials have settled upon the ratio between study and field work, and have also tabulated a more or less elastic statement of the time allowance for different projects. In case this is left to the teacher, it will be necessary for him to study the problems considered in the latter part of this publication.

The home project has been defined by this office as follows: "The term 'home project' applied to instruction in elementary and secondary agriculture includes each of the following requisites: (1) There must be a plan for work at home covering a season or a more or less extended period of time; (2) it must be a part of the instruction in agriculture of the school; (3) there must be a problem more or less new to the pupil; (4) the parents and pupil should agree with the teacher upon the plan; (5) some competent person must supervise the home work; (6) detailed records of time, method, cost, and income must be honestly kept; and (7) a written report based on the record must be submitted to the teacher. This report may be in the form of a booklet." Vacation work will be necessary in many projects.

Since the project is of a longer duration than the practicum elsewhere considered, and since it resembles the more important phases of farm work, the plan of procedure becomes very important; cost, income, and profit are factors which may help to rate the work. Examples of such projects would include the following:

Growing 1 acre or less of corn.
Growing one-eighth acre or more of potatoes.
Growing an acre of peanuts or cotton.
Raising a flock of poultry.
Managing a home garden of not less than one-tenth acre.
Raising one-tenth acre of tomatoes and canning the surplus.
Keeping dairy records, including milk tests.
Raising a litter of pigs.
Raising baby beef.
Picking, packing, and marketing fruit.
Orchard management, pruning, spraying, etc.

The teacher's problems are here considered under several cases, each dependent on the status of agriculture as a school study.

CASE 1. HOME WORK PRESCRIBED.

There should be an assigned value for each subject in the course, and in the case of agriculture a definite part of this value should

be apportioned to the recitation work and the home work separately. The application of a rank then becomes a simple matter, supposing that each home project has been approved at the outset as satisfying the time demands. The teacher will then rank each project, with such advice from experts as may be needed, in view of the evidence available and the reports rendered. This rank is averaged with other school ranks in accordance with the local system of percentages or other forms.

To make this concrete, suppose arithmetic recitations with extra study or preparation periods occur five days in a week and are granted five credits or points in the general average of the term or year. Then agriculture with prepared recitations five times each week would receive five credits. If instead of five recitations it is decided to have three each week and require home practice equivalent to the other two, then home practice would count two-fifths in making up the rank in agriculture. If, however, the practical work is to be rated as though it were a separate academic subject, the authorities would decide as to whether it should be the equivalent of a five-hour course or less.

Whenever this relative weight is fixed, each project should receive its rank in the same way recitation work is ranked and the average will be determined as is customary. This makes real school credit. To illustrate this: In the case where the project is to count as two-fifths of the agriculture, suppose the recitation course is ranked at 85 and the project 90 on the scale of 100.

Rank.	Hours.	
85	×3=255	Recitation total.
90	×2=180	Project total.
	5)435	

Total rank for agriculture= 87 on basis of 5 credits.

This rank of 87 per cent for agriculture would be averaged as a five-hour credit with other school branches in obtaining the general average rank. In a case where the two periods of practical work are in addition to the five periods of recitation, the total will be seven and the method of averaging will be as in the first case.

It may be the teacher's duty to approve the project and to decide as to how much weight it may have or as to how large a project it must be to equal the requirement for practical work. The school authorities having decided on the ratio as before referred to, it is necessary also to have a ruling as to how many hours of practical work shall equal one prepared recitation. This is usually set for not less than two hours of practical or laboratory work to one recitation period.

Under such circumstances two days of agricultural practice per week would call for not less than 4 hours of home work which, in a

school year of 36 weeks, would amount to 144 hours as a minimum. The total assigned value of the different projects allowed for one year should be not less than 144 hours if the work counts for 2 hours of class work or two-fifths of a full course. It would not be wise to encourage the pupil to carry much more than this unless it is evident that his other school work will not suffer from neglect because of this.

On the basis of 144 hours required, an acre of corn would require about half of this time in sections where the average labor records are above 60 hours per acre. Instead of allowing the pupil to grow 2 acres of corn, in which case the educational value is not increased, it is better to fill the other half of the required 144 hours with some animal project, as poultry keeping. The major part of the work with poultry is not done during the season when corn is grown, and there is a further advantage in applying the lessons on both plant and animal life. If the teacher has a competent advisory committee, it would be feasible to modify the requirements to meet local and individual conditions as in the following study adapted from records in the Office of Farm Management of the United States Department of Agriculture.

On a farm in Orleans County, N. Y., where approximately 20 acres of potatoes are raised as a main crop and approved methods are employed, the following variations are found in three successive years: [1]

Variation of hours of labor required to raise an acre of potatoes during different years.

	1911	1912	1913
Yield per acre (bushels)	207.79	208.50	173.21
Total man-hours (per acre)	89.13	69.70	72.09
Variations for different operations:			
Plowing	7.54	4.98	7.05
Cultivating	7.85	9.82	8.12
Hoeing	9.38	1.00	4.48
Spraying	7.21	5.06	2.51
Picking up	22.00	14.30	14.46

Such evidence as this tends to prove that it is not possible to assign a definite number of hours to the raising of a potato crop even with uniform methods, and where the credits granted are in terms of hours of work performed, it would be desirable to use the boy's time record within certain stated limits. In view of the records given above it might be decided that a boy on this farm should put in work equivalent to not less than 70 man-hours in raising an acre of potatoes and that his record for work would be accepted (under inspection) not to exceed 90 man-hours of necessary work. In view of the comparative difficulty of some of this labor for a boy

[1] Part of a record in the Office of Farm Management.

the figures might need revision. The boy might not be allowed to use more than two horses where the father would use four, and some of the manual labor would be heavier for him. In any case the raising of a single acre on this farm would require more than one-half of the 144 hours, assigned to project work.

Again, if the boy is to raise from one-eighth to one-half acre of potatoes only, almost every phase of the work will take more time relatively than it takes on larger fields. Planting, spraying, digging, and even hoeing may be done by hand and a reasonable time allowance is to be made. Such a study of the labor involved will assist in deciding how large a project the pupil should be encouraged to take. Too much project work may detract from the time needed for study; too little may not be worth considering for credit. The extent to which this work is new, and therefore educational, may be a factor in giving different credit for the same number of man-hours labor.

The first thing to be decided is whether the potato project is a suitable application of the agriculture taught. Then in view of the ratio established between textbooks and practice on the one hand and the estimated man-hours of labor in raising an acre of potatoes on the other, determine the question as to whether one-half acre or one-fourth acre or more is sufficient to satisfy the demands.

In case the pupil carries both a crop and an animal project, each may be determined in the same way for the proportionate time allowed. There is a manifest advantage in having both summer and winter projects.

Whenever projects have been carried out and reports rendered by pupils, the itemized records of time should be kept on file at the school to be used in considering future projects. The age and maturity of each pupil should be recorded with each report. These records may in time be of greater value in crediting projects than are the adult labor records which are at present the only available basis.

CASE II. HOME PRACTICE OPTIONAL.

In some cases where the study of agriculture is prescribed for the upper grades, it is not feasible to require any home work. It will then be best to offer added credit for home project work and average the rank on the project with the recitation rank in agriculture as in the former case. The ratio between the two should be fixed upon a fair basis and the same methods for obtaining the cooperation of the parents should be used as in other cases.

If the recitation course runs for three or four periods a week the home work should count for about two-fifths or two-sixths. When there are five recitations in agriculture it may be wise to count home work as three, unless it seems that the pupils ought not to carry that

much outside work. This would give a value of three-eighths to the practical work. Wherever the recitation course is optional, the home work should be a part of that course to be necessary for all who elect the course. In all such cases the methods of applying rank and credit are explained in the first case.

CASE III. NO COURSE IN AGRICULTURE.

In many rural communities where no course in agriculture has been introduced there is already more or less organized project work, which may be utilized by the schools. In some cases this is organized club work and in others it results from the interest and activity of the teachers. Where such conditions exist it is possible to use one of the two methods which have proven successful in some sections of the country.

Correlation method.—The teacher may plan to utilize the home work for the vitalizing of other school subjects. While this should be done, whether there is a course in agriculture or not, it provides a means for linking the school to the home in the absence of such courses.[1]

The teacher may have plans drawn, sketches made, problems solved, reports written, and letters prepared as a part of the home project, but credit each on the school rank in drawing, arithmetic, language, and other school branches. While this work is both project work and school work the rank is strictly school rank, and while the pupil is forwarding his project work he is getting real school credit for the educational phase.

Extra subject method.—Other school authorities have decided that home work should be ranked as an extra school subject, carrying weight in proportion to the work done, not to exceed one 5-hour subject. This limit might be made less than five units if desired. Where home work counts as a separate subject we might have the following conditions, based on three hours' credit per week:

	Rank.		Credit.		Total.
Arithmetic	80	×	5	=	400
Language	85	×	4	=	340
History	90	×	5	=	450
Geography	87	×	3	=	261
Home projects	90	×	3	=	270
			20		) 1,721
General average					85

Variations of this plan may be easily made to fit any local system of credits.

[1] This subject has been developed in recent bulletins issued by this department as U. S. Dept. Agr. Buls. 132 (1915), Correlating Agriculture with Public School Subjects in the Southern States, and 281 (1915), Correlating Agriculture with Public School Subjects in the Northern States.

To decide how much work is necessary to deserve such credits, proceed as in previous cases. In a 36-week year each recitation period per week calls for 2 hours of home work, which is equivalent to 72 hours of unprepared work, and a 5-hour recitation credit would be the equivalent of 360 hours of home work on the same basis. This appears very large and might be more than the authorities would care to recognize, lest it should tend to weaken the other school work. Two or three fifths of this will usually be considered high enough.

There will rarely be found cases where the parents will not be interested in having the pupils take up home projects, but it needs a prearranged plan to insure the kind of cooperation which carries the project to a helpful and successful conclusion. The parents should make an agreement with the teacher before the work begins. It would be best to make a written agreement in which the project is to be outlined and in which the parents agree to certain essentials of cooperation which follow. Oral agreements are less satisfactory.

ESSENTIALS OF COOPERATION.

The parent should agree: (1) To permit the pupil to use specified land, animals, and equipment, either as a temporary owner or as a tenant so far as the needs of the project are concerned; (2) to grant the pupil the time needed for the work and to verify and vouch for the time record; (3) to instruct the pupil in the necessary manipulation so far as practicable; (4) to allow the pupil the profits derived from his own labor and management. The last point is not always feasible, particularly where the pupil takes up one phase of the main business of the farm, such as the weighing and testing of milk for a dairy herd.

The parent must at least give an unbiased voucher of the time and expense record, and a statement that the project work was all done by the pupil. In the absence of an advisory committee or an inspector, the parent is the judge as to when the pupil has accomplished a task successfully.

Where the pupil's time is much needed by the parent in regular home duties it may be well to advise that the pupil take over some part of that home work as a project. This will insure the cooperation of the parents, although the "managerial" income may not come to the pupil.

The school should not only give credit for work for which the pupil receives pay, but should consider the relative income or profit as one important factor in determining the school rank given on the project.

To insure success, it will be very desirable to have a memorandum of agreement signed by all parties before the project begins; a report in full from the pupil, and a voucher from the parent at the end.

A memorandum of agreement might be similar to the following form:

Project agreement.

The parent, ..., agrees to permit his .....,
(Name.) (Son or daughter.)
....., to carry out at home the project of .....
(Name.)
according to the plan submitted, to encourage the pupil and to furnish .....
(Specify land,
..... in addition to the time required; to allow him all
animals, equipment, etc.)
actual profits from his project; also to check up the time records and vouch for the same.

The pupil, ..., agrees to carry out all the details of the project as agreed upon, to record, and report truthfully upon all items of labor, cost, and income, and to write a full report of all methods to be returned to the teacher. It is estimated that the labor involved will be between ..... and ..... man-hours.

The teacher, ...,
(Name.)
agrees to assist the pupil in obtaining information needed and to secure all possible supervision; to accept the work when the project is acceptably completed as equivalent to .....
(Amount.)
of school work and to enter the rank for the work and report as a part of the scholarship rank with a weight of.....

.....

....., Parent.
....., Pupil.
....., Teacher.
....., Superintendent of Schools.

This should be accompanied by a carefully written plan of work, or printed directions where such projects are organized under State or county leadership.

Parent's voucher on pupil's project.

Name of pupil.....
Residence.....
Parent's name.....
Project.....
Dates.....

I hereby certify that .....
(Name of pupil.)
..... in the manner described in his report; that he did all the work, with such exceptions as are noted in his report. [1] His own labor necessary to the success of his project was ..... hours; hired-man labor, ... hours; horse labor, ... hours.

[1] His expense, not including his labor, was..... $
[1] His income from all sources.....
His profit, disregarding his own time.....
His labor, ... hours, at ..... per hour.....

Net profit.....

The ..... exhibited in connection with his report were
(Samples, animals, etc.)
from his own project, and it is fair to rank him on this basis.

[1] Itemized accounts to be given in written report.

Remarks.....

.....

Signed.....

Relationship.....

Accepted.....

....., Teacher.

....., Inspector.

....., Superintendent of Schools.

Credit allowed..... Rank on project.....

..... Final rank in subject.....

CREDIT FOR HOME PRACTICUMS.

Contrasted with the larger projects are minor processes called practicums in which the element of skill becomes relatively large and there is less management and study required. Such processes as plowing a field, testing seed corn, transplanting tomatoes, or running a separator may be practicums.

If school credit is to be given for doing these things, it seems wise to require a minimum amount of practice and after that have the pupil tested to demonstrate his ability. If his skill is acceptable, give him the credit and rank but once instead of continuing the credits for further practice.

Some processes might be made prerequisites for certain projects, the credit for the project including that for the brief practicums involved. On the other hand, younger pupils might be encouraged to acquire the skill before the years when agriculture is studied as class work.

To make this concrete, consider the case of a boy with an acre of corn for his project. Before he can plow with a pair of horses he should have learned to harness the horses and drive them. Harnessing a pair of horses might then be a practicum for any boy strong enough to handle the heavy harness and previous to that he might have learned to put a light harness on the horse and hitch it to a buggy.

It would be well to allow a limited number of credits each year previous to the seventh grade and to keep a record from year to year of each boy's accomplishments. In some cases it will be possible to hold a public contest in which the pupils will be examined and ranked on their skill in their respective practice. In many cases the voucher of the parent alone will be sufficient. Another plan similar to the Boy Scout classes might be used in which a pupil would qualify for one class by performing a given number of specified tasks and receive a credit at the end of a year or a term. A competition day should be set. When desirable the public may be invited.

Relatively more credit should be given a lower grade pupil for success in one of these accomplishments, such as milking a cow properly or driving a pair of horses. If learning to milk is rated the same as one week's work in any subject for a seventh grade pupil, it may be wise to give twice that credit to a fifth grade pupil for the same work. (Age is perhaps a better basis than grade.)

Skilled workman credits. Agriculture.

Name of pupil.....
Date of birth.....
Residence..... Home equipment.....
.....

Credit and rank only after reasonable practice and skill accepted by judge.

Practicum.	Began practice.	Home practice.	Date of test.	Rank.	Age.	Grade.	Credit.	Judge or referee.
Sanitary milking								
Running separator								
Testing seed corn								
Plowing with pair								
Butter fat testing								
Transplanting tomatoes								
Ten farm knots								
Add others								

Extend this list as local conditions may warrant.

Give to each practicum the number of credits which fairly represent the number of prepared recitation periods needed to accomplish the skillful performance. Bear in mind the time used on arithmetic or other subjects in acquiring skill.

At the end of a term or a year, add all the credits and average the rank for the practical work. This rank should then average with other school subjects, bearing such weight as the ratio of these credit hours bears to the total number of hours for a subject which occurs each school day. If this sum of credits were 45 and the school year is 36 weeks, or 180 days, then the practical work would be the equivalent of $\frac{45}{180}$ or one-fourth of a full five-period course, and the rank should affect the general average with that weight.

If the pupil is studying agriculture, the rank on the practice should affect the rank in that subject first. In lower grades it is often simpler to apply this credit as though it were a separate subject rather than applying it to correlated subjects.

A blank to be filled and signed by the parent might be in some such form as the following:

Credit for skill in agriculture gained by home practice.

..... School.

I hereby certify that ..... continued home practice in
(Name.)
..... beginning ..... and end-
(Process.) (Date.)
ing ..... and has spent at this work not less than.....
(Date.)
hours.

I consider that he is now skillful in the accomplishment of this process.

Signed.....
Relationship.....
Countersigned....., Teacher.
....., Referee.
Credits..... Rank..... Record.....
(Speed, etc.)

The chief problem is to provide such records and such tests or examinations that the credit may not become perfunctory, thus making the plan a farce.

These practicums should no more be a "snap" for securing school credit easily than should other school work; neither should school credit replace other motives, such as filial respect, willingness to aid others, or loyalty to home and school.

To illustrate concretely how to give credit for practicums, consider that a pupil during the winter term of 12 weeks learns to run a separator and also to test seed corn. Suppose that the separator practicum is considered the equivalent of 5 recitations and the seed testing as 10 recitations and that a rank of 100 is given for the first and 85 for the second. The rank for seed testing counts as two-thirds of the total rank for practicums; hence

Seed testing=2× 85=	170
Separator =1×100=	100
Total to be divided by 3..	270

Average rank for practicums, 90 per cent.

If the pupil is studying agriculture and has 45 recitations during the term with a rank of 80, the rank for the practicums would average 45+15=60 total periods.

Recitation rank 80×3=	240 or $\frac{45}{60}$
Practicum rank 90×1=	90 or $\frac{15}{60}$
Total to divide by 4..	330

Average rank in agriculture=82.5.

In the absence of agriculture as a course, average as follows:

Recitation periods in term 240+15=255.
Practicums equal $\frac{15}{255}$ or $\frac{1}{17}$ of credit.
Recitation work counts $\frac{16}{17}$ or average rank.

All the exercises recognized should be adapted to local conditions. The school officials and competent farmers should be asked to check up the list and settle upon the credits due for each. Record of practice should be submitted.

SAMPLES OF BRIEF EXERCISES.

Hoeing corn, practice until skill is acquired and a test on 50 hills for a rank.
Hoeing potatoes, similar to corn.
Transplanting tomatoes or other plants, the test to be the doing of the work under observation.
Turning crank of milk tester within five revolutions per minute of the required number without a watch. Three consecutive trials.
Running the milk separator.
Milking a cow skillfully and in an approved sanitary way.
Putting light harness on a horse and hitching to a buggy without assistance.
Putting heavy harness on a team and hitching to wagon.
Driving from the seat and turning around where backing is necessary.

Driving a pair of work horses hitched to some farm vehicle or machine.
Driving four horses.
Doing various farm chores.
Feeding a dairy herd according to an established ration.
Tying skillfully 10 farm knots.
Stringing seed corn.
Husking 50 ears of corn in a specified time.
Weeding out garden rows sown in drills without disturbing plants unnecessarily.
Testing hens' eggs for market or during incubation.
Preparing Bordeaux mixture or other spray material.
Learning to sharpen a saw, an ax, shears, or mower knives.
Shocking grain; stacking hay or bundles of grain.
Properly tying a well-filled bag of grain or potatoes.
Properly sewing sacks of onions or other produce.
Cleaning cows or grooming horses.
Cleaning stables.

SAMPLES OF LONGER PRACTICUMS.

This group requires more planning and calls for some conclusions or computations. A reasonable time should be granted, after which the pupil should be required to demonstrate his ability to do the work and to make the proper interpretations of the result.

Testing milk and computing butter fat.
Testing seed corn.
Scoring and grading seed corn and other grains.
Running an incubator.
Sorting, grading and packing fruit.
Planting shade or fruit trees.
Keeping farm accounts from home data.
Running mower or other farm machine.
Plowing and harrowing.
Running the corn planter.
Home mixing of fertilizer.
Making a chicken house.
Using tools to construct or repair pens, houses, etc.
Repairing machines or harness.
Setting a shoe on a horse.
Removing a calf's horns.
Shearing sheep.
Pruning or spraying apple trees.
Running a corn binder.
Breaking a colt.

In these practicums the practice may be discontinued at about the time that the pupil has gained enough skill to make the work profitable.

Further practice will be vocationally desirable but from the school point of view credit should cease except as this practice figures in a project along the same lines, which will occur frequently.

SCHOOL ADMINISTRATION BASIS OF CREDIT.

The following questions arise wherever school authorities may consider this matter:

1. What is the status of agriculture in the rural school law of the State? Prescribed, permitted, or ignored?

2. What bearing have the statutes of the State on prescribing home work or study?

3. What is the attitude of the community in question on these subjects and how far will the local officials support the teacher and superintendent in progressive movements?

4. Is the present home work of the pupils sufficient and may the school work be correlated with it? Or will there be an advantage to the homes as well as the school if credit is given for organized and supervised school work, and will the parents welcome this plan?

5. May it be advisable to assign definite numerical credits for each subject in the grades as is usually done in the high school? What complications would be added if home work in certain lines were given a similar credit? Would such credit be of any real value unless its possession would assist in gaining promotion or graduation?

So far as possible the superintendent of schools (with the local school committee, if they are interested) should agree upon the basis of school credit for home work in agriculture, leaving to the teacher only the individual application and ranking. These officials should first appreciate why school credit is to be given and should decide upon the amount of home work to be recognized, its character, its ratio to school work and the general method of applying the credit. The assignment of values to various projects will be necessarily based on farm management studies. Some suggestions along this line follow this section.

Why give school credit?—Without practice at home or elsewhere the textbook course in agriculture would appear to have but little value. In the secondary schools it is customary to require in all branches so much work of the pupils that some of it must be done at home. In some elementary schools a similar requirement is made but this will not be tolerated in some sections as prescribed work.

Wherever such a requirement is common it would seem desirable that the pupil should take home for study or practice such subjects as may arouse home interest and cooperation and detract as little as possible from the family life. Required study of agriculture and home economics, rural-survey work, and correlations of such work with other branches would seem to meet these demands. Home practice in the garden or with the flock would seem even better than home study.

In such cases the school should require home projects in connection with the school course in agriculture and give a rank on the practical

work as well as on the study. Such a rank might average with the recitation rank on the basis of from one-fourth to one-half, according to circumstances as previously explained.

In communities where no home study may be demanded it is probable that most parents would encourage home project work so closely allied to family interests. In this case the required course in agriculture might, if required, be given additional weight for such home work. If five credits are given for the recitation course then seven or more might be allowed when the project work is completed in a satisfactory way. This method dignifies such work and gives it the rating of real school work.

What kind of credit?—In the secondary schools each subject has assigned a numerical value based upon the amount of work or the number of hours of recitation each week. A minimum requirement is made of the total hours of work necessary for promotion or graduation, and a pupil who elects to pursue a given subject knows how much it counts toward this minimum.

In the administration of rural schools it is unusual to find such an arrangement of credits with a minimum for promotion, so there is no obvious advantage to the boy who gets extra credits, so far as school advancement is concerned.

Any scheme of holidays, prizes, or other perquisites is evidently not school credit in the sense in which we deal with arithmetic and language. Either the rank given for home work must be applied to the correlated study in school or the units of credit given for home work must be based on units of credit in academic subjects and so arranged that these credits advance him toward a school goal.

Where the home project is a required part of the study of agriculture this is of less importance, since the rank in agriculture includes the practical work. Whenever this may be optional, there is an obvious advantage in giving credit that means something in terms of school work.

The school authorities may find it desirable to assign numerical values to all school subjects and place home projects in the list. It is possible to fix a minimum for promotion and to promote by subjects rather than by grades in the rural school.

In some cases other methods have been used, but the relation to academic credit is not as clear. Among these might be mentioned the following: (1) Holidays given for a given number of credits; (2) promotion at a lower grade; (3) automatic and arbitrary raising of lower grades without reference to their relation to the project; (4) honors or "cum laude" promotions, and (5) prizes and other rewards. Since these credits bear little relation to the work done,

such methods should be adopted only with caution and when it is impracticable to give real academic credit.

What ratio for practice?—School courses which have included laboratory work are often arranged for three recitation days and two laboratory days in each week. On the laboratory days two or more recitation periods are considered the equivalent of one prepared recitation, and the ratio of recitation to laboratory is then computed as 3 to 2. The school officials or whoever lays out the course should first decide on what this ratio shall be. The next point is as to how many hours of home work, not constantly under supervision, is the equivalent of one prepared recitation. Possibly an hour's work in the field is not the equivalent of an hour in the laboratory where the work is under the direction of a teacher. Since the class period in the grades is less than an hour, it may be fair to consider two hours of home work the equivalent of one prepared recitation period.

How much credit?—According to the plan mentioned, 72 boy-hours of work during the year will be necessary for each credit to be granted not to exceed five credits. Farm management studies and the analysis of farm records have given certain averages which may be taken as a guide under average conditions and may be modified to meet exceptional conditions. Such modifications should be made by a committee which might include, besides the teacher, the local superintendent of schools, the county agent, and one or more representative farmers.

It is obviously an advantage to avoid disagreement at the end of the project by settling at the outset how much credit will be granted for a given amount of work. If the amount of labor usually required for a given work is known or can be estimated in "man-hours," then a decision that a prepared recitation is the equivalent of two man-hours (or more or less) will fix the credit value of the project.

On the basis of a year of 36 weeks, 5 recitations a week or 180 per year would be the equivalent of 360 man-hours per year in home project work. This ratio needs revision whenever the discrepancy between "man-hours" and "boy-hours" of labor becomes large. In some types of work a boy is capable of greater progress than is a man, while in other work the boy would make relatively slow progress. The boy should not be encouraged to do too heavy work on his project, and where there are several new processes to be learned it may be wise to count the boy's time at full value. Future records of boys' labor on these different home projects will enable teachers and superintendents to rate these projects more accurately, but very many records will be needed in view of the diversity of boys' work.

A method less frequently used which appears quite practical is as follows: During the last two years of the elementary grades a pupil may obtain credits for home work which may equal not more than one 5-hour course of prepared school work. This divided between the two grades would make 2½ hours per week of academic credit, or on the basis of our previous discussion, 5 hours or more of home work per week for two school years. If this is not required, it should at least be elective, with some weight as an alternative. Such a method would equal approximately the amount of credit given when two days of practical work were credited each week under other methods.

In the secondary school, where there is usually an established system of credits, the application of these principles should be a simple matter, especially where the home project is a required part of the course in agriculture.

Whenever it is practicable, the superintendent should provide the teachers with lists of projects which may be used in the district and the usual labor ranges reduced to a basis of schoolboys' work. Such a form as the following might be used based on local records:

Home projects for the ..... School. Grades 7 and 8.

Project.	Unit.	Maximum time.	Minimum time.	Desirable range.
Growing corn	1 acre	86 hours	70 hours	¼ acre to 1 acre.
Care of laying hens	25 hens; 1 year.	140 hours	100 hours	6 to 50 hens; 6 months to 1 year.

Extend the list to cover all ordinary projects.

Whenever credit is given for home practicums a similar guide should be prepared for the teacher.

Home practicums for the ..... School. Grades 5 to 7.

Practicum.	Minimum practice.	Equivalent to recitations.	Required test.
Running separator	3 consecutive weeks	5	3 times; speed within 5 revolutions.
Hoeing corn	¼ acre	6	50 hills observed.
Testing seed corn	2 separate tests. 50 ears. Records.	10	Demonstration to teacher.

Supervision of projects.—In the estimation of many educators, the success of the whole project and credit plan depends on supervision, especially during the vacation months. The frequent visits of an inspector who will check up the work done and advise on the impending needs stimulate the pupil during those weeks when neglect is most probable. Usually pupils begin with much enthusiasm but have too little persistency to stick to a monotonous task alone

without some encouragement. Furthermore, the problems which arise during the vacation weeks are often critical and the pupil needs help.

Among the different methods of providing this supervision a few are named. In each case the supervisor must be capable and willing. Perfunctory supervision soon fails to accomplish the desired end.

1. High-school instructor of agriculture employed during the summer months to supervise all projects.

2. A local committee cooperating with the county agent, the latter to advise regularly and visit projects at least once during the summer.

3. A committee of the "parent-teachers association." With changing teachers this is valuable.

4. The local club leader cooperating with the extension service of the State agricultural college, with or without a local committee.

5. Local experts in plant or animal production might well be paid for a few such rounds of visits.

6. Resident teachers sometimes qualify as supervisors.

FARM MANAGEMENT BASIS OF SCHOOL CREDIT.

If the exact amount of labor for growing each crop and the ratio between projects could be definitely stated, this problem would be greatly simplified. It happens, however, that variations in the labor required for any project due to factors not entirely within control would not allow the use of averages in all cases. A study of the tables appended to this study (see pp. 21 to 27) will show that the labor on any given project varies much in different localities and under different conditions.

In Table 1, page 21, are shown the number of man-hours and horse-hours of labor in certain farm activities in a few States. It is evident that the averages often fail to apply to any one State. These figures, which are taken from unfinished studies in the Office of Farm Management, are to be weighed by further records but are sufficient for all purposes of this bulletin.

The succeeding tables show the variations in labor requirements and tend to prove that it is difficult to apply any average figures even for one State. They also suggest some of the factors that may vary the labor requirements of any project in a given community. The available studies are more detailed for some crops than for others and there is less information which will apply to animal projects.

The following method is suggested for any district in which there are no records to use as a basis for credit. From the figures quoted in the tables select those which apparently apply most nearly to the given locality. Determine upon a range of variation which will be allowed in giving the credit and ask the pupils to keep accurate records for the labor on their projects. It would be desirable also for

the pupils to keep labor records on different crops on their parents' farms, these to be used in arithmetic class problems and then compiled for the purpose of fixing a local basis for giving credit.

Factors causing variations.—Aside from the question of proper management and steady work there are several factors which very evidently affect the labor requirements of any project. In Tables 2, 3, and 4, adapted from Bulletin 266 of the Ohio Experiment Station, it is shown that the harvesting method, the size of the field, and the shape of the field each influences the labor requirements. Without doubt a small field will usually be used by the pupil.

In case any insect pest or disease comes upon the crop, the experience of fighting these doubtless has an educational value and deserves credit even if the extra labor diminishes the profit. This is quite different from extra labor due to poor methods or mismanagement.

It is also true that the character of the soil, the slope of the land, and local climatic variations will all influence the labor requirement and if some competent referee considers the records in view of these factors he may properly rate each project.

Labor in garden projects.—Because of the great variation in the crops raised in a garden and the local factors involved, only a few general suggestions may be given.

Family gardens of from one-twelfth to one-eighth acre would appear suited to pupils of the upper grades. This estimate will not fit all cases. Gardens comprising largely such crops as corn and potatoes demand relatively less time. Gardens having a large variety of vegetables, so planted as to need intensive cultivation, take more time and provide more education in the single project. The use of cold frames or a hotbed, growing succession crops, and either marketing or canning the surplus vegetables deserves added credit. After such projects have been carried out and itemized, if records are filed, the teacher and his advisers will be able to estimate in advance for future cases. The main issue is to map out a reasonable amount of work in view of the course and the credit given, and then require excellence in the work. Good practice and fair crops are as much an evidence of what the pupil has learned about gardening as any textbook recitations and examinations could be. Where one crop is raised, as tomatoes for canning, less experience may be gained in the season's work. If the pupil does the canning, however, this phase of the work deserves credit.

Where an animal project, particularly poultry, is carried at the same time, the results are better from an educational point of view than where a larger crop project is carried alone. Garden waste, as green food for the hens and hen manure for the garden, are examples

of the interlocking of two projects. Furthermore, they will illustrate more fully the school lessons in agriculture.

Small-fruit projects could rarely be considered complete in one season and the practice is quite different the second season. In some localities it might be wise to take up such a project with a two years' plan mapped out. Such a fruit garden would be from one-fourth to one-tenth acre, depending on the crop. (See Tables 10 and 18.)

PROJECTS WITH ANIMALS.

Nearly all the statistics available concerning labor in the care of animals refer to conditions quite unlike those existing in most project work. These figures have some value, however, as a starting point.

Poultry.—The table of labor requirements on page 21 gives 226.6 man-hours and 19 horse-hours required for 100 hens in New York or 128.5 man-hours and 16 horse-hours on an average of all studies. It may be evident that this ratio of 1.28 hours labor per hen would not hold for small flocks. It is more probable that with ordinary facilities it might take the boy as many hours to care for a flock of a dozen or 25 hens as the poultry man needs for 100.

A boy reported on his poultry project with 12 hens as taking one-fourth hour of work each day and three-fourths hour once each week for mixing feed, cleaning, and other extra work. This would amount to 130 boy-hours per year, not allowing for building, repairs, incubation, or care of chicks.

The work done by the pupil in caring for a small flock of poultry may bring educational returns commensurate with time spent up to a certain degree. Time spent in weighing feed, trap nesting, and making detailed records is worthy of credit and until enough local records have been compiled it may be wise to depend on the boy's corrected time sheet. Inspection of his work should help to make this record dependable. He should be advised not to charge the time spent in petting the animals or other ways which are not to be counted as productive labor.

Other animals.—Projects with other animals will vary much. The work which is repeated daily, like all farm chores, is educational for a while or until proficiency is attained. Ability to continue at the same task in a monotonous way until an end has been gained is a desirable farm habit. On the other hand, it is better to introduce feeding records, production tests, and other problems and to have the projects so laid out as to include a variety of experiences. Some of the processes may be standardized. As an example, let a boy feed, milk, and otherwise care for two cows for the winter season. Have him weigh the milk each day and twice each month test the milk for butter fat.

In a New Hampshire study it was found that a man would average to milk properly about seven cows in an hour, weighing and recording

the milk. The handling of the milk and cleaning utensils twice a day was figured at one hour a day for a small herd, while the care of the cow, feeding, preparing feed, cleaning cow and barn averaged about 20 minutes each day per cow.

If the cost accounts, labor, milk records, and butter fat computations are used in school problems, there would seem to be reason to give full credit for the time spent even in routine work. It would obviously not be desirable to give the same credit for a second season on such a project.

SUMMARY.

1. The home farm may be the logical laboratory for practical work connected with rural school agriculture. Home work carried on for this purpose may properly be given school credit just as home study of arithmetic gains credit.

2. The relative importance of a project from the school point of view depends upon its relation to school study; the amount of education involved; the improvement of the pupil in skill, method, or knowledge; the results or relative success measured partly by crops or profits; and the reports, essays, exhibits, and other evidence given at school.

3. The weight given should recognize, besides the educational factors, the period covered by the project; the hours of labor involved and the relative difficulty; the evidence of good management; the emergencies met and pests combated; and the success of adults in the same line of work during the same season.

4. The rank should depend on evidences of honest endeavor and thoughtful application of instructions.

5. Both weight and rank should be based upon the usual methods of ranking and crediting school subjects. Manual practice should not receive too much or too little relative recognition.

6. Until local records are compiled and analyzed from boys' and girls' projects, it will be best to use the most available records of man labor, modified as to relative difficulty, number of new operations involved, and other factors. These estimates may be gradually modified as experience is gained. The educational feature should always be kept in mind.

SUPPLEMENTARY TABLES OF LABOR REQUIREMENTS.

The following tables are selected with a view to assisting the school officials and teachers in three ways. In the first place, they tend to verify the statement that uniform records are not obtainable and that this problem is more or less local. It is also hoped that they give evidence of some of the factors which need consideration. Finally, it is probable that the selection and adoption of units and ratios from these tables may prove a good starting point in any community, these figures to be modified as local records are compiled.

TABLE 1.—*Labor requirements for different crops.*

[Average number of hours by sections, and the average of all the sections; also man and horse labor rates.][1]

Enterprise.	Illinois average.		New York average.		Iowa average.		Pennsylvania average.		Total average.	
	Man.	Horse.	Man.	Horse.	Man.	Horse.	Man.	Horse.	Man.	Horse.
Corn (grain), per acre	20.6	45.2	77.0	59.3	23.1	51.0	67.6	42.5	47.8	51.9
Silage, per acre			43.2	55.7	34.5	61.7	58.3	50.9	43.9	57.1
Potatoes, per acre			97.6	81.8	51.8	89.7	122.9	95.8	87.6	85.6
Alfalfa (harvesting)	14.0	15.0	(3 cuttings)		22.9	31.6	34.4	19.6	20.6	22.1
Apples (bearing), per acre									162.3	53.4
Horses, per animal unit	79.1	9.0	118.7	6.3	99.6	3.7	151.5		101.8	7.1
Cows, per animal unit	126.2	16.8	153.4	8.2			175.8	17.5	142.0	12.3
Poultry, per 100-hen unit			226.6	19.0					128.5	16.0
Manure, per ton	1.8	3.5	1.2	1.8	.9	1.7	2.1	2.6	1.5	2.4
Oats, per acre	11.4	21.9	19.7	25.2	14.6	23.8			15.7	23.7
Wheat (seeding), per acre	7.0	27.3	10.6	21.5	4.9	18.7	12.3	27.7	9.0	22.6
Wheat (harvesting), per acre	14.0	17.2	9.9	7.6	12.5	12.5	25.1	23.4	12.3	11.5
Wheat (complete), per acre			25.9	39.2	15.9	22.8			20.9	31.0
Beef cattle, per animal unit									27.7	15.5
Sheep, per animal unit									33.9	6.7
Peaches (bearing), per acre									90.5	33.8
Pears (bearing), per acre									116.7	45.1
Timothy hay, per acre									10.2	9.1
Timothy seed, per acre									8.7	9.2
Clover hay, per acre									12.3	12.2
Mixed hay, per acre									9.6	9.1
Labor rate, per hour	$0.164	$0.105	$0.155	$0.165	$0.127	$0.123	[2] $0.091	[2] $0.072	$0.154	$0.129

[1] Adapted from unfinished studies of the Office of Farm Management, U. S. Department of Agriculture.
[2] North Carolina.

An illustration of these variations and the factors involved is given in a study of the labor cost in producing corn in the State of Ohio.[1]

TABLE 2.—*Variation in labor cost of producing corn in Ohio.*

Methods used or factors involved.	Man-hours of labor per acre.			Methods used or factors involved.	Man-hours of labor per acre.		
	Maximum.	Minimum.	Average.		Maximum.	Minimum.	Average.
Harvesting method:				Size of fields—Con.			
1. Grain harvested	97.60	40.64	48.18	3. From 5 to 10 acres	.....	.....	62.03
2. Hogged off	30.30	12.38	23.38	4. From 10 to 15 acres	.....	.....	56.63
3. Silage	73.92	40.49	57.21	5. From 15 to 20 acres	.....	.....	50.76
4. Contracted in part	68.98	20.19	43.96	6. From 20 to 25 acres	.....	.....	36.20
Sections of the State:				Shape of field:			
Southeast	.....	.....	69.68	1. Less than 2½ acres	[2] 83.58	[3] 87.47	84.79
Northeast	.....	.....	68.53	2. 20 to 25 acres	[2] 22.91	[3] 42.48	36.20
Northwest	.....	.....	50.06				
Southwest	.....	.....	36.04				
Size of fields:							
1. Less than 2½ acres	.....	.....	[1] 84.79				
2. From 2½ to 5 acres	.....	.....	59.53				

[1] Note the relatively large amount of labor on the fields of less than 2½ acres. This difference would be still greater on fields of 1 acre or less.
[2] Rectangular.
[3] Irregular.

TABLE 3.—*Average amount of labor for different parts of the work on corn in Ohio.*

[Adapted from Ohio Station Bulletin 266.]

Groups of items.	Man-hours.	Horse-hours.	Approximate per cent of total labor cost.	Groups of items.	Man-hours.	Horse-hours.	Approximate per cent of total labor cost.
Preparation of seed bed	7.92	20.58	24	Fertilizing	.....	.....	11
Planting	1.78	2.02	4	Overhead labor	.....	.....	4
Cultivating	9.89	13.16	21	Care of seed	.....	.....	1
Harvesting	20.98	12.40	34	Miscellaneous	.....	.....	1

The more detailed analysis indicates the relative value to be credited for various operations. Where an operation like harrowing or cultivation is repeated the number of man-hours would be increased accordingly. The following table covers nearly all combinations:

[1] Adapted from Ohio Agricultural Experiment Station Bul. 266 (1913).

TABLE 4.—*Labor requirements for corn per acre once over in Ohio.*

[Adapted from Ohio Station Bulletin 266.]

Operation.	Hours per acre.		Operation.	Hours per acre.	
	Man.	Horse.		Man.	Horse.
Manure	11.79	17.65	Cultivating—Continued.		
Care of seed	.81	.08	Cultivating, 2 horses	1.68	3.36
Preparation of seed bed:			Hoeing	12.23	.....
Plowing	5.44	13.16	Harvesting:		
Harrowing (spike)	.99	2.68	Cutting by hand	9.06	.....
Disking	1.02	2.96	Cutting by machine	2.53	3.86
Planking	.93	2.51	Cutting silage corn by machine	2.59	5.00
Rolling	.76	1.61	Shocking	3.53	.....
Planting:			Picking up ear corn after binder	1.61	2.23
Marking out, 1 horse	1.58	1.58	Filling silo[1]	23.23	19.50
Marking out, 2 horses	.76	1.52	Husking by hand	14.41	.....
Planting by hand	2.38	.....	Hauling corn[2]	3.90	6.45
Drilling	1.50	1.82	Hauling fodder[2]	2.45	3.34
Planting, 2 horses	.93	1.86	Snapping, jerking, and husking from stalk	10.77	13.80
Replanting	1.85	.....	Husking and shredding	12.73	12.02
Replanting part area	1.17	.....	Shredding	4.95	4.33
Cultivating:			Hauling shock corn	7.15	9.05
Harrowing after planting	.71	1.64			
Rolling after planting	.70	1.40			
Using weeder	.74	.74			

[1] Includes the time for cutting the corn in the field. [2] After corn has been husked from shock in field.

The following data were obtained in a southern area studied by the Office of Farm Management of the U. S. Department of Agriculture:

TABLE 5.—*Labor on corn, Coastal Plain, central Georgia.*

[77 records, average yield 24.5 bushels per acre.]

Operation.	Man-hours.	Mule-hours.[1]	Operation.	Man-hours.	Mule-hours.[1]
Cut stalks, plow and harrow	7.5	9.4	Harvesting	7.0	3.5
Lay off, bed, etc	2.5	3.6			
Plant, fertilize, cultivate	13.1	13.7	Total	40.4	30.2
Pull fodder (295 pounds per day)	10.3	.....			

[1] Note the relatively small amount of mule labor.

These conditions are average rather than ideal, as the yield of 24.5 bushels testifies, but it is not evident to what extent the figures would be modified by improved practice. Factors which are found in intermediate States are illustrated in the following list of operations. Not all of the operations were used on any one field.

TABLE 6.—*Labor on corn, Warren County, Ky.*

Operation.	Man-hours.	Horse-hours.	Operation.	Man-hours.	Horse-hours.
Manuring	10.0	20.0	Thinning	2.0	.....
Breaking	4.0	12.0	Cultivating, 4½ times	6.0	12.0
Rebreaking	4.0	12.0	Cutting and shocking	6.6	.....
Disking, twice	2.6	10.4	Pulling ears	7.7	.....
Harrowing, twice	2.2	4.4	Cribbing	2.0	2.0
Drag	1.1	2.2	Hauling fodder	3.3	6.6
Rolling and laying off	1.4	1.4	Shredding	13.4	15.5
Planting	.7	1.4	Silo	20.0	23.0
Harrowing	2.2	4.9			

TABLE 7.—*Labor on eight farms in Arkansas.*

Crop.	Man-hours.	Horse-hours.
Corn	41.75	44.28
Cotton	69.40	36.50
Sweet potatoes	104.30	64.30

TABLE 8.—*Labor on cotton, Coastal Plain region, Georgia.*

[85 records, average yield 0.63 bale per acre.]

Operation.	Man-hours.	Mule-hours.	Operation.	Man-hours.	Mule-hours.
Cut stalks, plow, harrow	8.3	17.6	Haul to gin (average haul 2.5 miles), 225 bales per day	2.8	5.6
Lay off, bed, etc	4.2	4.8	Marketing lint	1.9	3.8
Plant, fertilize, and cultivate	18.1	18.8			
Chop and hoe	13.5		Total	111.8	50.6
Picking (average 150 pounds per day)	63.0				

The number of man-hours may be reduced by using more mules and the yield may be increased by better practice. The increased yield would require more picking and possibly leave the total man-hours much the same. Pupils' records on cotton projects should prove helpful.

Man-hours of labor on potato crop.—A few districts selected from those covered by farm management studies will demonstrate the variations in the amount of labor required to raise an acre of potatoes in different parts of the country. A large number of farms were averaged in each section and in each case there was much variation even in the same county. These statistics are based on areas large enough to lead us to expect efficient use of labor. The number of horses used may account for some variations, soil conditions and methods for others. In some cases the picking up was done by contract labor but this is not averaged in with the other fields. Where contract labor is used the figures would be of little value for school estimates.

The following districts were selected as showing enough variation and a sufficient number of farms to be representative: Districts—1, Aroostook County, Me.; 2, Steuben and Schuyler Counties, N. Y.; 3, Waushare, Portage, and Waupaca Counties, Wis.; 4, Clay County, Minn.; 5, Monmouth County, N. J. (cover crop); 6, Charleston County, S. C.; 7, St. Johns County, Fla.; 8 Montrose County, Colo. (irrigated). The labor variations in these districts were as follows:

TABLE 9.—*Variations in amount of labor required for different operations in raising an acre of potatoes.*

Processes.	Man-hours per acre by districts.							
	1	2	3	4	5	6	7	8
Clearing land	.....	.....	.....	.....	1.5	2.9	3.0	.....
Plowing	5.3	5.3	3.6	2.6	3.2	5.4	4.2	5.2
Preparing seed bed	5.3	7.4	2.1	1.0	3.7	4.7	6.6	1.5
Hauling fertilizer	3.4	7.0	.....	.....	1.8	4.0	6.0	.....
Preparation of seed	6.6	4.3	3.2	3.7	6.2	.....	7.0	4.3
Applying fertilizer	.....	1.0	.....	.....	.....	2.0	2.0	.....
Planting, machine	2.9	4.4	.....	1.6	2.6	.....	3.7	2.5
Planting, hand	.....	3.5	3.2	.....	.....	6.7	10.0	.....
Harrowing, after planting	.....	1.0	1.5	1.5	2.4	1.4	1.0	6.0
Cultivating	13.7	17.3	9.8	6.8	14.2	26.0	10.9	10.2
Spraying, machine	3.7	.....	1.6	.8	1.0	3.2	2.2	1.0
Spraying, hand	.....	.....	.....	.....	.....	4.4	.....	.....
Digging, machine	4.3	2.5	2.3	1.9	2.6	3.0	.....	2.2
Digging, hand	.....	19.2	.....	.....	.....	18.7	28.8	.....
Picking up, by hand	16.4	13.5	11.1	.....	20.0	27.7	24.2	.....
Hauling and marketing	12.4	15.0	18.0	17.8	8.3	6.4	8.8	21.9
Irrigating	.....	.....	.....	.....	.....	.....	.....	5.5

Contract labor not included above.
Total labor, maximum, 125 hours; minimum, 29 hours.
Average for Aroostook County, Me., 67.5 hours.
Variations in Minnesota district, 29 to 80 hours.
Variations in Wisconsin district, 36 to 109 hours.
Other potato data will be found in the body of the text on page 4.

TABLE 10.—*Labor required per acre for strawberries, Bowling Green, Ky.*[1]

First year.	Man-hours.	Horse-hours.	Second year.	Man-hours.	Horse-hours.
Manure	20.0	40.0	Mulch	10.0	10
Breaking	4.0	11.2	Pick	320.0	.....
Rebreaking	4.0	11.2	Pack and grade	32.0	.....
Disking	2.5	7.5	Nail boxes	16.0	.....
Harrowing twice	2.0	6.0	Hauling	17.0	35
Lay off twice	2.0	6.0	Bar off	3.3	33
Planting	33.3	.....		1.6	32
Cultivate 10–20	49.5	49.5	Cross harrow	4.0	8
	24.0	48.0	Cultivate	50.0	50
Hoe	40.0	.....		25.0	50
			Hauling	4.0	.....

[1] Two and three horse teams were used except in some of the cultivating.

Since the picking and marketing is so large a part of the labor and must vary with the crop, totals would be of comparatively little value here. These items will serve as a guide in inspecting a record, however.

TABLE 11.—*Selected miscellaneous estimates.*

[Adapted from studies in New York State.]

Project.	Man-hours.	Horse-hours.	Project.	Man-hours.	Horse-hours.
Hay and alfalfa, each cutting	10.0	10.0	Sheep, each	5.0	0.3
Corn, all kinds, per acre	60.0	70.0	Brood sow and pigs until weaned	30.0	5.0
Beans, per acre	50.0	50.0	Other hogs, each	5.0	1.0
Potatoes, per acre	120.0	100.0	Poultry, per head	1.5	.2
Root crops, per acre	150.0	120.0	Pullets, per head	1.5	.2
Truck crops, per acre	150.0	150.0	Bees, per swarm	3.0	.6
Truck crops (per $5 received)	10.0	10.0	Retail milk, per cow	150.0	150.0
Cows, each	150.0	20.0			

The following table copied from Farmers' Bulletin 661, Method of Analyzing the Farm Business, gives standards which may be modified as local experience may render advisable:

TABLE 12.—*Approximate work units needed for the production of crops and in caring for live stock, etc., a work unit being a 10-hour day of man or horse labor.*

Operation.	Work units (10-hour days).	
	Man.	Horse.
Production of crops (per acre):		
Timothy, alfalfa, and clover hay, per cutting	1	1
Oats, wheat, barley, rye, buckwheat, and miller	2	3
Corn husked from standing stalks, corn-belt States	2 to 3	5
Corn husked from shock	6	6
Corn for silo	4 to 6	5 to 7
Corn husked, Southern States	3 to 4	3 to 4
Potatoes	8 to 12	10
Cotton	8 to 12	4 to 6
Sugar beets	7	7
Melons	4	2
Cabbage	13	12
Peanuts	3	1
Sorghum sown broadcast, cut for hay	4	4
Tobacco	20	7
Field beans	5	5
Apples	15	5
Caring for live stock (per year):		
Horses, corn-belt States	8	$\frac{1}{2}$
Horses, Eastern States	12	$\frac{3}{4}$
Dairy cows	15 to 20	1 to 2
Young stock, cattle, colts, etc	$2\frac{1}{2}$ to 3	$\frac{1}{10}$
Ten hogs, corn-belt States	10	2
Ten hogs, Eastern States	20	2
Ten brood sows and raising pigs to weaning	30	5
100 ewes	50	5
100 chickens (well cared for)	15 to 25	1

SELECTED CLUB RECORDS OF BOYS' AND GIRLS' WORK.

Up to the time this list is compiled, club work has varied much in the several States and labor records have not as yet formed a basis for estimates of credit. Some records are available in detail and others as summaries; some were based upon one conception of labor units and some on another idea. Yet the figures which follow should give some assistance in making estimates until such a time as the local records become a satisfactory basis of credit. If boys and girls are led to take an interest in getting these accurate records rather than to subordinate everything to winning prizes, the value of their records will be considerable.

TABLE 13.—*Specimen labor records of corn-club boys in Northern States.*

State.	Preparation of land.	Planting.	Cultivating.	Hoeing.	Gathering.	Total.	Yield.	Cost.
							Bushels.	
New York	21	2½	11	13	40	87½	61	$26.40
	10	17	14	53	110	194	40	31.30
New Jersey	8	1½	10	.....	20	39½	102	21.05
Pennsylvania	8	1	2	.....	50	61	94	51.25
	45	3	15	.....	32	95	93	28.75
Iowa	6½	1½	6	12	9	35	84	11.45
	10½	1½	4½	1	30	47½	120	16.13
Illinois	4	1	6	10	10	31	88	10.90
	10	¾	5	.....	8	24	48	10.58

TABLE 14.—*Georgia corn-club labor records.*

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.	Cost.
					Bushels.	
Boy 1	13	9	6	28	50	$12.50
Boy 2	18	7	15	40	59	33.62
Boy 3	16	26	64	96	103	37.72
Boy 4	9	30	15	54	57½	25.16
Boy 5	16	16	30	62	147	33.70

TABLE 15.—*West Virginia corn-club labor records.*

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.	Cost.
					Bushels.	
Boy 1	11½	19	30	60½	150	$23.50
Boy 2	15	31½	30	76½	55	19.90
Boy 3	31	15	50	96	60	14.30
Boy 4	13	55	35	103	48½	18.45
Boy 5	33	45	35	113	49	24.00
Boy 6	14	17½	35	66½	83½	29.59

The average of 12 West Virginia boys, who raised 100 bushels or more of corn, was 103 hours of labor per acre.

TABLE 16.—*Arkansas corn-club labor records.*

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.
					Bushels.
Maximum	36	48	26	92	142
Minimum	4	5	6	17	32
Average	15	20	14	48½	75

Maximum labor record gave minimum yield.
Men's average for the same section, 47.8 hours.

TABLE 17.—*Selected corn-club records from Mississippi.*

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.	Cost.
					Bushels.	
Boy 1	16	10	10	36	54	$26.50
Boy 2	37	32	16	85	55	24.45
Boy 3	18	30	16	64	74	27.90
Boy 4	7	20½	15	42½	52½	19.62
Average	18.6	32.4	12.6	62.6	56	24.38

Ten boys with average yield same as average corn yield for the State.

TABLE 18.—*Selected Texas corn-club records from average conditions.*

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.	Cost.
					Bushels.	
Boy 1	13	12	14	39	90½	$12.15
Boy 2	11	12	8	31	43½	17.71
Boy 3	7	16	4	27	30	8.80
Boy 4	9½	20	10	39½	19	12.95
Boy 5	7½	13	6	27	32	20.50

TABLE 19.—*North Carolina corn-club records 1914.*[1]

	Preparation.	Cultivation.	Harvesting.	Total.	Yield.	Cost.
					Bushels.	
Boy 1	18	16	20	54	56	$17.40
Boy 2	22½	25½	8	56	59½	26.23
Boy 3	19	26½	30	75½	80	40.37
Boy 4	9½	5	15	29½	74	22.53
Boy 5	10	10	20	40	67½	15.00
Boy 6	35	39	16	90	67	32.10
Boy 7	25	24	40	89	97	30.25
Maximum	38	66	40	105	97	54.15
Minimum	7½	5	8	29½	43	15.00
Average	18	24	16	58	70	34.00

[1] Fields producing over 100 bushels not included in this list. Seven representative records were selected from 32 typical projects.

In Alabama 200 reports for the season of 1914 show an average of 63.9 hours of boy labor producing an average crop of 60 bushels.

Records of Oklahoma members show for 10 cotton records an average of 97 hours labor per acre; highest, 116 hours; lowest, 76 hours; for 9 corn records, average 42 hours; maximum, 58 hours, minimum, 26 hours; for 5 Kafir records, average 30 hours; maximum, 42 hours; minimum, 19 hours.

Louisiana averages for 10 corn-club members show, hours, 52.5; yield, 91.9; cost, $24.60; age, 16.1; for 10 canning-club members, hours 58.3; yield, 78.60; cost, $22.47; age, 17.

TABLE 20.—*Garden-club records from Texas.*

	Preparation.	Growing.	Gathering.	Canning.	Total.	Yield of tomatoes.
						Pounds.
Girl 1	3½	23	23	10	59½	2,324
Girl 2	3¼	21	5	15	44¼	1,246
Girl 3	3	4½	9½	10½	27½	1,700

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